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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

DCS5078 – DATABASE SYSTEMS
(DIT & DBIS Groups)

08 MARCH 2016
2.30 p.m - 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of **EIGHT (8)** pages excluding the cover page. There are **THREE (3)** sections in this question paper.
2. **SECTION A:** There are **TWENTY (20)** Multiple Choice questions (MCQ) (20 marks). Answer **ALL** questions on the OMR sheet provided.
3. **SECTION B:** There are **FIFTEEN (15)** True/False questions (15 marks). Answer **ALL** questions in the OMR sheet provided.
4. **SECTION C:** There are **THREE (3)** questions (45 marks). Answer **ALL** questions in the answer booklet provided.

Section A: Multiple Choice Questions (Total: 20 Marks)

Instruction: Choose the BEST answer. Use the OMR answer sheet provided to mark the correct answer.

1. Data consist of facts, text, and other multimedia objects, while ____ is data that have been processed in such a way that it can increase the knowledge of the person who uses it.
 - a. statistical analysis
 - b. information
 - c. query report
 - d. metadata
2. What is the function of a data dictionary?
 - a. It creates storage structures for the data.
 - b. It acts as a backup for the stored data.
 - c. It provides a spell checker for end users.
 - d. It manages data definitions and their relationships.
3. Which type of database would be the most suitable to support the work of several scientists performing research on a new drug?
 - a. Workgroup database
 - b. Enterprise database
 - c. Personal database
 - d. Web-enabled database
4. Which of the following is an advantage of Database Management System (DBMS)?
 - a. Sharing of data in the database.
 - b. Enable enforcement of data privacy and security policies.
 - c. Provide better data integration.
 - d. All of the above.
5. Which of the following problems associated with storing data in a list is avoided by storing data in a relational database?
 - a. Maintaining the data may require changing the same data value in many locations.
 - b. Inconsistency when a data item is used multiple times.
 - c. Duplication of data items.
 - d. All of the above.
6. A key that contains two or more attributes is called a _____.
 - a. super key
 - b. composite key
 - c. secondary key
 - d. candidate key
7. A CUSTOMER table's primary key is CUS_CODE. The CUSTOMER primary key column has no null entries, and all entries are unique. This is an example of ____ integrity.
 - a. entity
 - b. referential
 - c. complete
 - d. null
8. Which of the following explains the relationship between movies and actors?
 - a. one-to-many
 - b. many-to-many
 - c. one-to-one
 - d. many-to-one

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PET					
PetID	Name	Type	BreedName	DOB	OwnerID
1	King	Dog	Std. Poodle	2/27/2009	1
2	Teddy	Cat	Cashmier	2/1/2010	2
3	Filo	Dog	Std. Poodle	7/17/2008	1
4	AJ	Dog	Collie Mix	5/5/2009	3
5	Cedro	Cat	Unknown	6/6/2007	2
6	Woolley	Cat	Unknown		2
7	Buster	Dog	BorderCollie	12/11/2006	4

BREED			
BreedName	MinWeight	MaxWeight	AverageLifeExpectancy
BorderCollie	15	22.5	20
Cashmier	10	15	12
Collie Mix	17.5	25	18
Std. Poodle	22.5	30	18
Unknown			

Figure A1: PET and BREED Table

Refer to Figure A1 for Question 9 & 10.

9. What is the foreign key for BREED table?
 - a. none
 - b. BreedName
 - c. PetID
 - d. OwnerID

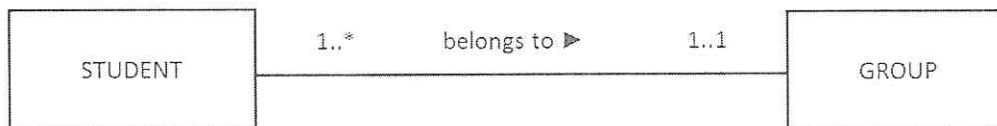
10. Supposed the administrator inserted a record (8, "Jack", "Cat", null, 7/7/2010, null) into the PET table, what would be the result?
 - a. Operation would be not allowed because this will violate the referential integrity rule.
 - b. Operation would be allowed because BreedName and OwnerID are foreign keys that can be null.
 - c. Operation would have resulted in an empty row inserted in the other related tables.
 - d. None of the above.

11. Studying the existing system hardware and software happens in which of the Systems Development Life Cycle (SDLC) phase?
 - a. maintenance
 - b. planning
 - c. implementation
 - d. analysis

12. The sequence that is followed when designing a DBMS is _____.
 - a. physical design, conceptual design and logical design
 - b. logical design, physical design and conceptual design
 - c. conceptual design, logical design and physical design
 - d. logical design, conceptual design and physical design

Continued.....

13. Analyzing a company's situation is part of the ____ phase of the DBLC.
- implementation and loading, testing and evaluation
 - database design
 - database initial study
 - operation
14. In UML-style E-R diagrams, the entity class symbol contains what information in the second segment?
- attributes
 - methods
 - metadata
 - constraints
15. You are given a Unified Modeling Language (UML) class diagram with two entities, STUDENT and GROUP, as shown below. What is the suitable business rule to specify the following diagram?



- A student belongs to only one group at most and a group can have many students that belong to it.
 - A student belongs to one and only one group and a group has at least one student or many students that belong to it.
 - A group has only one student and each student can belong to more than one group.
 - None of the above.
16. In a UML-style E-R diagrams, a(n) _____ attribute can be modeled by listing the components below the attribute.
- composite
 - derived
 - inherited
 - repeating
17. The Database Administrator (DBA)'s managerial role covers the _____.
- evaluation and testing of databases and applications
 - training and support of people to use the database management system and its tools
 - enforcement of policies, procedures and standards
 - None of the above
18. Procedures are _____.
- written instructions to describe a series of steps to be followed during the performance of a given activity
 - general statements of direction or action that communicate and support DBA goals
 - created by programmers to create a secure system
 - named collection of settings that controls how much of the database resource a given user can use

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Section C: Structured Questions, 3 Questions (Total: 45 Marks)

Instruction: Please write all your answers in the Answer Booklet provided.

QUESTION 1 (15 marks)

Ace Music center has requested you to create a database to keep track of new music song sheets that has been uploaded by visitors at their website. You are required to draw a complete **Crow's Foot ERD** based on the following descriptions. You must clearly show the *connectivity* and the *relationship participation* in the diagram.

The center has a listing of popular songs that can be identified by the song name, song composer and year it was created. Each song belongs to at most one of the many listed genres at the website such as rock, pop, hip-hop and so on. Visitors can also view the songs by genre at the website. Each song and genre at the website are identified by a unique id.

Once registered in the website, visitors may upload as many song sheets as they want for the existing songs in the website. The song sheets details are song sheet id, date, instrument, description of the song sheet and file (in pdf format). It is important to keep the details of the visitors such as visitor name, email address and gender. Each visitor will also be given a unique number to make it easier to identify them.

Each uploaded song sheet refers to one and only one song and each song is referred by many song sheets. Usually new songs will be listed at the website even though the song sheets for it will be available later. As the song sheets are being uploaded on the Internet for public viewing, some of the song sheets may have reviews from other visitors. The review date and the feedback are recorded in the database.

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QUESTION 2 (15 Marks)

The tables below show a number of blood donation drive events that were held in 2015 in Melaka. Every event is sponsored by at most one sponsor and each sponsor can sponsor more than one event. Based on the tables and its contents, answer the following questions.

EVENT Table

Event ID	EventDate	EventContactName	EventContactNum	Units Yield	Sponsor ID
1011	2015-07-12	Mazni	012-551 0543	20	S01
1012	2015-08-22	Hazim	012-531 8883	35	S02
1013	2015-09-28	Hayley	012-556 6541	55	S03
1014	2015-10-18	Peter	012-556 4542	15	S04
1015	2015-10-20	William	017-451 0544	33	S03
1016	2015-10-27	Arshad	012-751 7545	45	S01

SPONSOR Table

SponsorID	SponsorName
S01	HongLeong Bank
S02	MBO Melaka
S03	Hatten Hotel
S04	Multimedia University

- a. Write the SQL command to create the EVENT table. The EventID is the primary key with the length of 4 characters. The EventDate is of date type. The EventContactName has a length of 30 characters. The EventContactNum has a length of 12 characters. The UnitsYield has a length of 3 integers and the SponsorID has a length of 3 characters. EventID and EventDate must not be NULL. [3 marks]

- b. Write the SQL command to display the highest units yield as shown below. [1 mark]

highest
55

- c. Write the SQL command to display the event date and event's contact number of the event's contact name that starts with 'H' as shown in the next page. [2 marks]

Continued.....

EventDate	EventContactNum
2015-08-22	012-531 8883
2015-09-28	012-556 6541

- d. Write the SQL command to display the number of events sponsored by each sponsor as shown below. [2 marks]

SponsorID	Total no of Events
S01	2
S02	1
S03	2
S04	1

- e. Write the SQL command to insert another record into the SPONSOR table with values 'S05' as the sponsor id and 'MMC Corporation' as the sponsor's name. [1 mark]
- f. Write the SQL command to display the listing of event details in ascending order based on the sponsor's name as shown below. [2 marks]

EventDate	EventContactName	EventContactNum	SponsorName
2015-10-20	William	017-451 0544	Hatten Hotel
2015-09-28	Hayley	012-556 6541	Hatten Hotel
2015-10-27	Arshad	012-751 7545	HongLeong Bank
2015-07-12	Mazni	012-551 0543	HongLeong Bank
2015-08-22	Hazim	012-531 8883	MBO Melaka
2015-10-18	Peter	012-556 4542	Multimedia University

- g. Write the SQL command to update William's contact number to '017-451 0501'. [2 marks]
- h. Write the SQL command to display the event date and units yield which is greater than the average units yield as shown below. [2 marks]

EventDate	UnitsYield
2015-08-22	35
2015-09-28	55
2015-10-27	45

Continued.....

QUESTION 3 (15 marks)

The Head of Training Department has requested your help to normalize the following records into appropriate tables to ease their data entry job. Based on the table given below, do the following:

- Draw the complete dependency diagram for the 1NF. [5 Marks]
- Write the 2NF and 3NF. [10 Marks]

STAFF_ID	STAFF_NAME	STAFF_GENDER	TRAINING_ID	DATE	TITLE	DURATION	VENUE_ID	VENUE_NAME	TRAINER_ID	TRAINER_NAME	STATUS
30802492	Jane Lim	Female	TM_102	6-Jan-16	Effective Communication	2 days	TX5	Power	10010823657	Joel Ting	Approved
			TM_133	10-Apr-16	Public Speaking	1 day	TX1	Airelle	1001005313	Aidah Mahmud	Approved
			TM_242	12-Jun-16	Hands-On Microsoft Access	2 days	TX6	Suria	10010823657	Joel Ting	Pending
30868857	Harry Poh	Male	TM_133	10-Apr-16	Public Speaking	1 day	TX1	Airelle	1001005313	Aidah Mahmud	Approved
30868840	Faridah Ali	Female	TM_103	12-Feb-16	Personal Grooming	1 day	TR2	Bravo	1001078880	Melvin Goh	Pending
			TM_133	10-Apr-16	Public Speaking	1 day	TX1	Airelle	1001005313	Aidah Mahmud	Pending
30898037	Kumar Sanjay	Male	TM_110	12-Jan-16	Intermediate PHP/MySQL	3 days	TR2	Bravo	10010823657	Joel Ting	Approved
			TM_103	12-Feb-16	Personal Grooming	1 day	TR2	Bravo	1001078880	Melvin Goh	Pending